



RCRA, Superfund & EPCRA Hotline Training Module

Introduction to:

**Boilers and Industrial
Furnaces
(40 CFR Part 266, Subpart H)**

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BOILERS AND INDUSTRIAL FURNACES

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1. INTRODUCTION

The training session on incinerators provided an introduction to combustion devices and burning, as well as a discussion of the specific regulations affecting the incineration of hazardous waste. This module addresses the combustion of hazardous waste in boilers and industrial furnaces (BIFs) and reviews the regulation of these types of units, found in 40 CFR Part 266, Subpart H.

When EPA instituted the Resource Conservation and Recovery Act (RCRA) hazardous waste regulations in 1980, it did not regulate hazardous waste recycling activities. The Agency emphasized that it was encouraging only legitimate recycling activities, not treatment or disposal disguised as recycling. In 1985, EPA promulgated regulations covering the burning of hazardous waste for energy recovery in BIFs under Part 266, Subpart D. Because these facilities were considered recycling facilities, they were subject to limited standards, largely administrative, covering only management of the waste prior to burning and notification and recordkeeping. The devices themselves were not subject to technical or emissions standards; nor were the facilities governed under the treatment, storage, and disposal facility (TSDF) requirements. These regulations, though minimal, were in line with the Agency's policy of encouraging recycling and reclamation activities.

The February 21, 1991, BIF rule dramatically changed the requirements for burning hazardous waste in boilers and industrial furnaces (56 FR 7134). This rule subjected BIFs to almost all TSDF standards, including extensive emissions controls, waste analysis, and permitting requirements. The regulations were expanded to cover more devices and place some limitations on specialized units. As a result of this final rule, Part 266, Subpart D, was entirely removed and the regulations governing burning hazardous waste in BIFs were codified in Part 266, Subpart H.

This module summarizes the regulations affecting hazardous waste processed in BIFs. After completing this module you should be able to:

- Define boilers and industrial furnaces and describe the criteria associated with the definitions
- Describe the requirements for processing hazardous waste in BIFs, including the distinctions between permitted and interim status units
- Explain the requirements for the specially regulated BIF units and give examples of each.

Use this list of objectives to check your knowledge of this topic after you complete the training session.

2. REGULATORY SUMMARY

The following is a summary of the regulations affecting hazardous waste processed in BIFs. These requirements include the general facility standards for TSDFs, extensive emissions control regulations, standards for the direct transfer of waste from a transportation vehicle to a unit, and regulation of residues. Some units are subject to special reduced requirements depending on the type of waste processed in the unit and the unit's capacity. Because of the technical nature of these regulations, only an outline of the requirements is provided here. For more detail concerning BIFs and their implementing procedures see the February 21, 1991, Federal Register (56 FR 7134).

2.1 GENERAL APPLICABILITY

The regulations in Part 266, Subpart H, apply to all hazardous waste burned or processed in BIFs regardless of the purpose of burning or processing (e.g., recycling or destruction).

For a thermal unit to be classified as a boiler, it must:

- Be an enclosed device that uses controlled flame combustion to recover and export energy in the form of steam, heated fluid, or heated gases
- Have a combustion chamber and primary energy recovery system that is of integral design to ensure the effectiveness of the unit's energy recovery system
- Maintain a thermal energy recovery efficiency of at least 60 percent
- Export and use at least 75 percent of the recovered energy.

Comparatively, industrial furnaces use thermal treatment of hazardous waste to accomplish recovery of materials or energy. For a unit to be classified as an industrial furnace, it must meet the regulatory description of one of the following 12 devices:

- | | |
|---|---|
| • Cement kiln | • Lime kiln |
| • Aggregate kiln | • Phosphate kiln |
| • Coke oven | • Blast furnace |
| • Smelting, melting, and refining furnace | • Titanium dioxide chloride process oxidation reactor |

- Methane reforming furnace
- Halogen acid furnace
- Pulping liquor recovery furnace
- Combustion device used in the recovery of sulfur values from spent sulfuric acid.

The Administrator may, after notice and comment, add other devices to the list of industrial furnaces. In adding devices to the list of industrial furnaces, EPA will consider several factors related to the design and use of the unit.

EXEMPTIONS

The following wastes and devices are exempt from BIF requirements (§266.100(b)):

- Used oil that is burned for energy recovery under Part 279
- Gas recovered from hazardous or solid waste landfills when the gas is burned for energy recovery
- Hazardous wastes that are exempt from regulation under §§261.4 and 261.6(a)(3)(iii)-(v)
- Hazardous waste from conditionally exempt small quantity generators regulated under §261.5
- Coke ovens that burn only K087, decanter tank tar sludge from coking operations.

Some other specific units are subject to modified or less stringent requirements. These specially regulated units are addressed in detail in Section 2.5 of this module.

MANAGEMENT PRIOR TO BURNING

Hazardous waste managed prior to burning in a BIF is subject to all applicable RCRA regulations (§266.101). Generators of hazardous waste are required to comply with Part 262 regulations, while transporters of hazardous waste are subject to Part 263. In addition, any storage prior to burning is subject to the hazardous waste storage regulations in Parts 264/265 and 270 except under limited circumstances. This management requirement includes any storage activities conducted by the burner as well as any intermediaries.

2.2 EMISSIONS STANDARDS

Prior to the promulgation of combustion standards for BIFs, owners/operators were not subject to substantive performance standards. As a result of the final BIF rule, however, both permitted and interim status BIFs are now required to comply with

strict air emissions standards to ensure adequate protection of human health and the environment. These standards are divided into four containment categories: organics, particulate matter, metals, and hydrogen chloride (HCl) and chlorine (Cl₂). For each category or type of emission, the regulations establish compliance methods and alternatives. Each is addressed below.

ORGANICS

Burning hazardous waste that contains toxic organic compounds under poor combustion conditions can result in substantial emissions of the toxic compounds originally present in the waste, as well as emissions of other compounds due to partial or incomplete combustion of the waste constituents. The risks posed by these types of emissions can result in an increased lifetime cancer risk to humans. EPA controls these types of organic emissions from BIFs by implementing two types of organic emission performance standards. The first requires the measurement of the unit's destruction and removal efficiency (DRE), and the second limits the unit's output of carbon monoxide (CO). Both of these standards are discussed below.

Destruction and Removal Efficiency (DRE)

The DRE is a measurement of the unit's capability to destroy hazardous waste. BIFs must achieve a DRE of 99.99 percent for each principle organic hazardous constituent (POHC) in the hazardous waste during a trial burn (§266.104(a)). The Regional waste management director will designate POHCs for each waste feed (§266.104(a)(2)). Due to an increased threat to human health and the environment, the required DRE for certain dioxin-bearing wastes has been established at 99.9999 percent (§266.104(a)(3)). Unlike most other emission standards, the DRE standard only applies to permitted units.

Under certain conditions, a BIF owner/operator may obtain an exemption from the DRE requirements when burning low-risk waste (§266.109(a)). Waste can be shown to be low risk if, under a reasonable, worst-case scenario, emissions of organics and metals do not exceed acceptable levels.

Certain boilers that operate under specific conditions (§§266.110(a)-(f)) and that do not burn dioxin-containing wastes are considered to be in conformance with the DRE standards, and thus do not need to perform a trial burn to demonstrate DRE compliance (§266.110).

Carbon Monoxide

In addition to the DRE standard, part of meeting the organic air emission standards is limiting the BIF's emissions of products of incomplete combustion (PIC). PICs are organic materials formed during the combustion process, either as products that escaped combustion or as breakdown or recombinant organic compounds that did not exist in the original waste. Under RCRA, PIC refers to Appendix VIII organic compounds not present in the feed that result from combustion of waste. These PIC controls under the BIF standards include limits on carbon monoxide (CO) emissions

and, if necessary, hydrocarbon (HC) emissions from the unit. These standards are organized into three tiers. Under the Tier I controls, emissions of CO may not exceed 100 ppmv (parts per million by volume), with no limits on HC emissions. If owners/operators are unable to meet this standard, Tier II places HC limits at 20 ppmv, with CO emission limits based on levels demonstrated during the unit's compliance test.

EPA realized that some types of industrial furnaces, such as cement, light-weight aggregate, and lime kilns may be unable to meet the 20 ppmv limit on HC emissions allowed under Tier II because of organics present in the normal raw materials being fed into the BIF. As a result, the Agency established an alternative, site-specific HC limit that owners/operators of such facilities may request as part of the permit application process.

This alternative HC limit for furnaces with organic matter in raw materials was vacated by a federal appeals court in a 1994 court decision, and the controls were declared legally obsolete in a June 29, 1995, Federal Register notice (60 FR 33912). Thus, the Tier III controls were removed from the regulations.

PARTICULATE MATTER

The second category of emissions standards involves particulate matter. Because toxic metals and organic compounds may attach to particulate matter of smaller size that can be caught in the lungs, EPA established that unregulated particulate emissions could pose a significant threat to human health and the environment. EPA set an emission limit of 180 milligrams per dry standard cubic meter (dscm) (§266.105). BIFs that qualify for the low-risk waste exemption as mentioned above, however, are not subject to the particulate matter standard (§266.109(b)).

METALS

Another aspect of the emissions standards involves limits on metals. Metals regulated under the BIF standards are categorized as either noncarcinogenic (e.g., antimony, barium, lead, mercury, silver, and thallium) or carcinogenic (e.g., arsenic, cadmium, chromium, and beryllium). An owner/operator can determine the allowable feed or emission rate for any regulated metal using any one of a combination of three approaches. These approaches, referred to as "tiers," range from a simplified analysis based on conservative assumptions (Tier I) to a site-specific analysis based on detailed facility information and air dispersion modeling (Tier III). The choice of tiers is up to each individual owner/operator. Factors that may be considered in selecting a tier include the physical characteristics of the facility and surrounding terrain, the anticipated waste compositions and feed rates, and the level of resources available for conducting the analysis.

Tier I

Tier I is the most simple and conservative approach of the inorganic emission tiers. This tier limits the hourly feed rate of individual metals into the combustion device using feed rate limits that EPA already established. These limits can be found in Part 266, Appendix I. The Agency established these feed rate limits as a function of flue gas flow rate, stack height, terrain, and land use in the vicinity of the facility (§266.106(b)). After examining all these factors in conjunction with each other, the Agency back-calculated from EPA-prescribed acceptable air quality levels using conservative air dispersion modeling to arrive at an acceptable feed rate for the different types of metals. The type of modeling used assumes that 100 percent of the metals fed into the BIF will be emitted into the ambient air. Thus, using these feed rate limits does not allow site-specific factors to be incorporated into emission allowances for the BIF.

Tier II

Tier II, as opposed to Tier I which limits waste feed rate, places limits on the stack emissions of individual metals from BIFs. As with Tier I, emission limits have been pre-determined by the Agency by considering a number of different factors (i.e., stack height, terrain, and surrounding land use) (§266.106(c)). Tier II differs from Tier I, however, in that owners/operators are able to conduct emission testing to take credit for reduced metal emissions achieved either by the partitioning of pollutants to bottom ash or products, or by removal of the pollutants through the facility's air pollution control device. By conducting tests to determine how much of the metals fed into the BIF actually get carried through to be emitted through the stack, owners/operators using Tier II can conceivably increase the amount of metals in the waste feed by accounting for waste partitioning and pollution control activities.

Tier III

Tier III standards are established on a site-specific basis. Tier III standards are implemented in the same way as Tier II, by placing emission limits on metals, but unlike Tiers I and II, there are no pre-determined levels established by EPA. Instead, Tier III levels are determined by testing emission rates for each individual metal using air dispersion modeling techniques to predict maximum ground level metal concentrations that will not adversely affect human health and the environment, and by demonstrating that ambient air levels will not be exceeded (§266.106(d)).

Adjusted Tier I

A BIF owner/operator may adjust the feed rate limits that have been established in Appendix I by combining some of the aspects of Tier I and Tier III. This alternative is implemented in the same way as the Tier I standards, by regulating feed rates into the BIF, but allows for limits that are more relevant to a given facility (§266.106(e)). As with the Tier III methodology, owners/operators may back-calculate maximum allowable emission rates for individual levels from acceptable ambient air levels

(found in Appendices IV and V) using site-specific air dispersion modeling. These emission limits then become the adjusted feed rate limits, assuming all metals that are fed into the combustion device will be emitted as gases.

Alternative Implementation

This alternative allows for different approaches to demonstrating compliance with the organic emission standards by creating a combination of the Tier II and Tier III emissions limits. Rather than monitoring metals feed rates, a BIF may use an alternative method contingent upon approval from the Regional waste management director (§266.106(f)).

HYDROGEN CHLORIDE AND CHLORINE GAS

The fourth emissions standard under the BIF regulations limits the unit's output of hydrogen chloride (HCl) and chlorine gas (Cl₂). These rates are implemented in the same way as the metals emissions, using the tiered approach (§266.107). The screening levels for waste feed and emission limits are found in Part 266, Appendix II. For a more detailed discussion of EPA's tiered approach, see above.

2.3 PERMITTED FACILITIES

Operating standards are designed to ensure compliance with performance standards by establishing both permitted and interim status conditions for owners/operators to follow. Requirements for facilities operating under a permit differ slightly from those under interim status. Both interim status and permitted BIFs are subject to dual regulation under RCRA. In other words, facilities must comply with the specific regulations (e.g., emission standards) of Part 266, Subpart H, as well as the general standards in Parts 264/265. The requirements for permitted units will be addressed first, followed by those for interim status units.

TSDF STANDARDS

Whereas prior to 1991 BIFs were virtually exempt from regulation, BIFs are now regulated less like recycling units and more like TSDF units. The February 21, 1991, rule (56 FR 7134) subjects permitted BIFs to all the general TSDF standards including general facility, preparedness and prevention, contingency plan, manifest system, closure and financial assurance, corrective action, and air emission standards (§266.102(a)(2)).

HAZARDOUS WASTE ANALYSIS

The BIF owner/operator must perform a waste analysis to identify the type and quantity of the hazardous constituents that may reasonably expected to be found in the waste. The analysis must include all hazardous constituents found in Appendix VIII of Part 261. The facility must provide an explanation for those constituents not

included in the analysis (§266.102(b)(1)). In addition, periodic sampling and analysis must be undertaken while a BIF is operating to ensure that the hazardous waste is within the limits of the facility's permit (§266.102(b)(2)).

PERMITS

Once a BIF is permitted, it can burn only those types of hazardous waste specified in its permit. In addition, owners/operators must manage the unit in accordance with all of the operating conditions described in the permit (§266.102(d)(1)). These operating restrictions and waste feed allowances are established by the owner/operator through a test period referred to as a trial burn. The trial burn is the basis on which EPA establishes a particular facility's permit standards (§266.102(d)(4)). Owners/operators must develop a trial burn plan and perform the trial burn under conditions that will most likely ensure compliance with emissions standards. Once the trial burn has been completed, the facility's waste feed and operating requirements must be those demonstrated in the trial burn.

Operating requirements for BIFs are determined on a site-specific basis, and serve as day-to-day requirements that the facility must follow in order to continually achieve the emissions standards set by the regulations. The BIF regulations do not specify precise operating requirements; rather, emission standards in the regulations are the performance standards which will dictate the nature of the operating standards established in the permit. Owners/operators may use the emission standards from the regulatory requirements to "back-calculate" necessary operating limits for the BIF. Operating requirements are established during the trial burn phase of the permitting process. Data gathered from the trial burn (or alternative data) are used by EPA to establish the operating limits that will be included in the facility's final permit. Depending on the emission standard the facility has chosen to follow (i.e., Tier I, Tier II, or Tier III), facility permits may have operating requirements for the following operating parameters:

- Feed rate of hazardous waste and other fuels
- Feed rate of each metal, chlorine, and chloride in feed streams
- Maximum and minimum production rate when producing product
- CO and HC concentrations in stack gas
- Maximum combustion chamber temperature
- Maximum flue gas temperature entering particulate matter control
- Various air pollution control system-specific operating parameters
- Minimum combustion gas temperature
- Maximum emission rate for each metal, HCl, and Cl₂
- Appropriate controls for the hazardous waste firing system
- Appropriate indicator of combustion gas velocity
- Allowable variation in BIF system design or operating procedures
- Other operating requirements as necessary to ensure that the DRE is met.

In addition, the permit will establish general operating requirements for fugitive emissions, automatic waste feed cutoff, monitoring and inspections, direct transfer, recordkeeping, and closure (§266.102(e)).

2.4 INTERIM STATUS FACILITIES

EPA estimated that of the 1,000 BIFs burning hazardous waste prior to the final rule, only 150 would apply for interim status and eventually seek final RCRA permits. Owners/operators of facilities that burn hazardous waste in a BIF during the interim status period are subject to the provisions of §266.103.

To be considered operating under interim status, the facility must have been in existence on or before August 21, 1991, and must have submitted a Part A permit application by this date. If the facility already had a permit for another activity, owners/operators must have submitted a permit modification under §270.42. If the facility was already operating under interim status, then it was required to comply with the requirements for changes under interim status described in §270.72.

As with permitted BIFs, owners/operators of interim status BIFs must comply with all applicable TSDF regulations in Part 265. Until EPA calls in the facility's Part B permit application, where precise permit conditions will be established through a trial burn, owners/operators of interim status BIFs must ensure compliance with emission standards (§§266.105 - 266.107) by showing certification of precompliance and certification of compliance. During the certification of precompliance the owner/operator had to establish operating conditions that would allow the BIF to meet emission standards. The owner/operator then had to certify, through a certification of compliance, that the operating limits ensured compliance with emission standards. Both of these requirements are discussed in more detail below.

CERTIFICATION OF PRECOMPLIANCE

The owner/operator of a facility that sought to qualify for interim status must have established operating conditions under which the BIF would meet emissions standards. These operating conditions must have included feed rates of hazardous waste, metals, chlorine and chloride, and ash. The operating conditions should have been documented in a certification of precompliance, which must have been submitted by August 21, 1991 (§266.103(b)). Evidence that the facility owner/operator notified the public of the burning activities and permitting procedures through a major local newspaper also must have been included in the certification of precompliance (§266.103(b)(6)).

CERTIFICATION OF COMPLIANCE

Owners/operators that were required to submit a certification of precompliance must have conducted compliance testing on or before August 21, 1992. During this period, the operating conditions previously established during precompliance were

tested. Within 90 days after compliance testing, the owner/operator must have submitted a certification of compliance containing operating conditions based on the results of the testing. The certification must have included a description of any changes that had taken place since precompliance, as well as the test data and results of quality assurance and quality control work. The owner/operator was required to recertify within three years (§266.103(c)).

Compliance with the interim status standards is analogous to compliance with a Part B permit. Throughout interim status, the BIF is required to comply with the operating limits established during compliance testing. As mentioned above, interim status BIFs must be operated much in the same way as those facilities with permits. Because interim status facilities have not yet conducted trial burns to ensure compliance with the standards, EPA has placed some restrictions on their use and what types of hazardous waste these facilities may burn. These restrictions are discussed below.

PROHIBITION ON BURNING DIOXIN-CONTAINING WASTE

A BIF operating under interim status may not burn dioxin-containing hazardous wastes (F020, F021, F022, F023, F026, and F027) or any material derived from one of these wastes (§266.103(a)(3)). As an exception to this prohibition, interim status BIFs may burn F032 waste (even though it is listed for the presence of dioxin) because the Agency does not consider it "acutely toxic."

SPECIAL REQUIREMENTS FOR INTERIM STATUS FURNACES

EPA established special interim status requirements for industrial furnaces to ensure adequate combustion of hazardous waste until more stringent, permitted conditions could be established through completion of the facility's trial burn. These requirements do not apply to a furnace that burns hazardous waste solely as an ingredient. The requirements also do not apply to any furnace that feeds the hazardous waste into the hot end of the furnace, where products are normally discharged and fuels are normally fired. All furnaces not meeting one of these criteria are subject to the controls of §266.103(a)(5)).

As mentioned above, those interim status industrial furnaces that burn hazardous waste either for destruction or energy recovery must follow the special standards given in the BIF regulations. EPA considers a hazardous waste with concentrations greater than 500 ppmw non-metal hazardous constituents to be burned for destruction. In addition, a hazardous waste with a heating value greater than 5,000 Btu per pound is said to be burned at least partially for energy recovery.

2.5 SPECIALLY REGULATED UNITS

Under the provisions of the BIF regulations, certain combustion units are exempt from select parts of the regulations. The following types of units are eligible for these reduced requirements:

- Smelting, melting, and refining furnaces
- Small quantity burners.

These units and the conditions that apply to their regulatory status are described in more detail below.

METALS RECOVERY

Owners/operators of smelting, melting, and refining furnaces that process hazardous waste solely for metal recovery are conditionally exempt from regulation under this subpart, except for proper management prior to burning and the regulation of any residues. Units which may be covered by this exemption include pyrometallurgical devices such as cupolas, sintering machines, roasters, and foundry furnaces, but do not include cement kilns or halogen acid furnaces.

To receive this exemption, the owner/operator must comply with basic recordkeeping and analysis requirements. Owners/operators of these facilities must provide one-time written notification containing the following information: (1) a notice claiming the exemption; (2) an indication that the waste is being burned solely for metal recovery; (3) a statement that the waste contains recoverable levels of metals; and (4) a testament that the owner/operator will comply with all recordkeeping requirements (§266.100(c)(1)). The facility is required to maintain records documenting compliance with this exemption for at least three years. In addition, the owner/operator must sample and analyze the hazardous waste and other feedstocks as often as necessary to demonstrate compliance with the exemption.

The Agency has established three criteria to determine if hazardous waste is being legitimately burned for metals recovery: (1) the heating value of the waste does not exceed 5,000 Btu/lb (if so, the waste is considered to be burned for energy recovery); (2) the concentration of Part 261, Appendix VIII, organic constituents does not exceed 500 ppmw (if so, the waste is considered to be burned partially for destruction); and (3) the waste must have demonstrated recoverable levels of metals (§266.100(c)(2)).

Special Industries

Certain industrial units, such as secondary lead and nickel-chromium smelters, mercury recovery furnaces, and process wastes from metals recovery normally do not meet the conditions necessary to enjoy the reduced requirements referenced above. Examples include units that burn spent lead acid battery parts containing

pieces of rubber or plastic and which generally have heating values greater than 5,000 Btu/lb. In order to accommodate these special industries, EPA revised the BIF standards to conditionally exclude those wastes which are processed for metals recovery, but do not meet the criteria outlined above. In order to meet the criteria for this exclusion, wastestreams in these units must contain recoverable levels of metals and the waste must not contain more than 500 ppm of the toxic organics listed in Part 261, Appendix VIII. In addition, the owner/operator must comply with all notification and recordkeeping requirements in §266.100(c)(3).

Precious Metals Recovery

Metal recovery units engaged in precious metals recovery are also conditionally exempt from Part 266, Subpart H. Precious metal recovery is defined as the reclamation of economically significant amounts of gold, silver, platinum, palladium, iridium, osmium, rhodium, ruthenium, or any combination of these metals (§266.70(a)). Provided the owner/operator complies with the alternative requirements of §266.100(f), the unit would be exempt from all BIF requirements except for the regulations concerning the management of residues in §266.112. As with the recovery units mentioned above, owners/operators must provide a one-time written notice, conduct sampling and analysis, and maintain records to demonstrate compliance with all applicable requirements. In addition, any management prior to burning in this type of unit is subject to the applicable regulations found in §266.70.

SMALL QUANTITY BURNER

Owners/operators of facilities that burn small quantities of hazardous waste in on-site BIFs are exempt from Part 266, Subpart H. They must, however, meet the following criteria: (1) the facility must comply with the quantity restrictions based on the terrain-adjusted stack height; (2) the hazardous waste firing rate may not exceed one percent of the total fuel requirements; (3) the waste must have a minimum heating value of 5,000 Btu/lb as generated; and (4) the facility is prohibited from burning any waste that contains or is derived from the dioxin-bearing waste codes (i.e., F020, F021, F022, F023, F026, or F027) (§266.108(a)). Small quantity burners are also required to notify EPA and maintain facility records documenting compliance with these restrictions (§266.108(e)). In addition, small quantity burners are exempt from the requirements in Parts 264/265, Subparts A through L, and Part 270 with respect to the storage of mixtures of hazardous waste and primary fuel, if the waste is stored in tanks that feed fuel directly into the burner (§266.101(c)(2)).

2.6 DIRECT TRANSFERS

Facilities that transfer hazardous waste directly from a transport vehicle (e.g., tanker truck) to the BIF without first storing the waste must comply with special requirements (§266.111). Generally, the direct transfer operations must be managed in a manner similar to that required by the regulations for hazardous waste storage

tanks and containers. In addition, the direct transfer equipment must have a secondary containment system, the owner/operator must visually inspect the operation at least once every hour, and the facility must keep records of these inspections.

2.7 REGULATION OF RESIDUES

Under the traditional hazardous waste regulations, the derived-from rule requires that anything derived from the treatment, storage, or disposal of a hazardous waste is, itself, a hazardous waste (§261.3(c)(2)). Given this fact, any residues generated from the burning of hazardous waste in a BIF would normally be considered a hazardous waste under RCRA and would need to be handled in accordance with Subtitle C regulation. The Bevill Amendments, however, provide three statutory exclusions from the definition of hazardous waste for certain residues: residues from the burning of coal and fossil fuels (§261.4(b)(4)); cement kiln dust (§261.4(b)(8)); and residues from the processing of certain mining wastes (§261.4(b)(7)). Some question has arisen as to whether these exemptions should apply if residues are produced in part from burning hazardous waste. EPA has ruled that the exemptions may stand if the co-processing does not significantly affect the character of the waste residues. EPA has provided criteria under §266.112 to determine whether the residues have been significantly altered. Thus, the regulations retain the Bevill exclusion for residues from certain BIFs as long as the burning or processing of the hazardous waste does not significantly affect the character of the residue. These BIFs include:

- Boilers burning primarily coal (i.e., at least 50 percent coal)
- Industrial furnaces processing primarily normal ores or minerals (i.e., at least 50 percent normal nonhazardous raw materials)
- Cement kilns processing primarily normal raw materials (i.e., at least 50 percent normal raw materials).

To determine whether the character of a residue has been significantly affected by the burning or processing of hazardous waste, and thus whether the Bevill exemption can be claimed, one of two criteria must be met. As long as the residue meets either criteria, it will qualify for the Bevill exclusion.

The first criteria compares the hazardous waste residues to waste residues that would be found if the BIF were not burning hazardous waste at all. A statistical test, found in Appendix IX of Part 266, describes methods that should be used when comparing the waste-derived residues to these baseline levels to determine whether the character of the residue has been significantly affected.

The second criteria compares the concentrations of toxic constituents found in the waste-derived residue to health-based constituent limits found in Appendix VII of

Part 266. In response to a 1993 petition, however, EPA replaced the health-based limits for nonmetal constituents with the LDR standards listed under F039.

Provided the residues meet these standards, they would not be regulated as hazardous waste (58 FR 59598; November 9, 1993). If results from either part of this test indicate that the character of the residue has not been significantly altered, the BIF residue qualifies for the Bevill exemption.

3. SPECIAL ISSUES

The following BIF issues are frequently misunderstood by callers and are important components in correctly applying the BIF regulations.

3.1 FUEL BLENDING

Hazardous waste fuel blending facilities conduct activities that constitute storage and/or treatment of hazardous wastes. Consequently, they are subject to full RCRA regulation, including permitting, with a few exceptions. Some fuel blenders have asserted that, since their activities are considered recycling, the blending operation is exempt from permit requirements according to §261.6(c). Section 261.6(a)(2), however, clearly states that hazardous wastes which are recycled materials and are burned for energy recovery are regulated under Part 266, Subpart H, and all applicable provisions of Parts 270 and 124. As a result, fuel blending activities may be fully regulated.

3.2 BUBBLE APPROACH TO MULTIPLE STACKS

The standards for both metals and HCl/Cl₂ emissions are health risk-based, taking into account the maximum annual average ground level concentration an individual could be exposed to at an off-site location. The bubble approach requires facilities to consider the emissions from all regulated units which have emission standards based on the maximum exposed individual (MEI), when demonstrating compliance with the acceptable ambient levels. Therefore, if an owner/operator of a facility has any units for which emission standards are health risk-based, regardless of the tier used to comply with the standards, they are required to use the bubble approach to calculate expected emissions and operating limits. Examples of units (other than BIFs) that may be covered by the bubble approach are incinerators and thermal treatment units.

3.3 SHAM RECYCLING

Prior to certification of compliance, interim status owners/operators must not feed hazardous waste into a boiler or industrial furnace if the waste has a heating value of less than 5,000 Btu/lb as generated. This policy is intended to ensure that wastes processed in interim status BIFs are properly combusted, since BIFs are subject to fewer controls prior to certification of compliance. Wastes burned in BIFs with lower Btu values are more likely to vent hazardous contaminants to the atmosphere as unburned or partially burned combustion products, presenting a substantial risk to human health and the environment. By requiring burners to demonstrate that a waste's heating value is greater than or equal to 5,000 Btu/lb, the Agency is able to ensure a high enough temperature and long enough residence time in the boiler to destroy hazardous constituents at a rate which is protective of

human health and the environment. There are some specific instances in which a BIF may burn hazardous waste with a Btu value of less than 5,000 (§266.103(a)(6)).

It is important to note that, after certification of compliance, a BIF is no longer required to prove that the wastes being burned have an as-generated heating value greater than or equal to 5,000 Btu/lb. The requirement that burning of wastes be protective of human health and the environment, which was previously upheld by the sham recycling policy, will now be satisfied through compliance with emission standards established in the facility's permit.

3.4 OMNIBUS AUTHORITY

The omnibus provision allows the Regional Administrator or state to incorporate into a permit any provision deemed necessary to protect human health and the environment (§270.32(b)(2)). Specifically, this allows EPA to incorporate terms or conditions that are not found in the regulations. Under the Strategy for Hazardous Waste Minimization and Combustion, EPA has directed the states and Regions to conduct site-specific risk assessments (incorporating direct and indirect exposures) under the omnibus authority. These risk assessments should be conducted by the implementing agency during the permitting process.

3.5 PUBLIC PARTICIPATION

On December 11, 1995, EPA published a final rule expanding the role of public participation in the RCRA permitting process (60 FR 63417). This rule affects boilers and industrial furnaces by increasing the extent of public participation during the trial burn process. Specifically, the permitting agency is required to issue a public notice prior to approving a facility's trial burn plan and must announce the commencement and completion dates for all trial burns. The proposed public participation rule (59 FR 28680; June 2, 1994) also included some changes to the procedural requirements for permitting interim status facilities. These changes, however, were not finalized because of pending technical revisions to the hazardous waste combustor standards. See the Regulatory Developments section of this module for a discussion of these revisions.

4. REGULATORY DEVELOPMENTS

On April 19, 1996, EPA published a proposed rule under the joint authority of RCRA and the Clean Air Act to revise the technical standards for hazardous waste combustors (61 FR 17358). Specifically, this rule will affect incinerators, cement kilns, and lightweight aggregate kilns. EPA plans to address boilers and other industrial furnaces in a future rulemaking. This rule fulfills EPA's commitment to upgrade emissions standards as stated in its 1993 Hazardous Waste Minimization and Combustion Strategy.

The rule proposes emissions standards for dioxins/furans, mercury, cadmium, lead, particulate matter, chlorine, carbon monoxide, hydrocarbons, and several low volatile metals. It also proposes a new comparable fuels exclusion, and makes significant changes to the existing combustion regulations. A final rule is expected in December 1996.

